

OCTOBER
1956

- ANALYSIS OF WORLD-WIDE IONOSPHERIC PROPAGATION
- UNDERSTANDING T.V.I.
- R.S.G.B. TELEPHONY CONTEST

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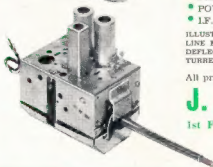
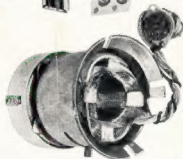
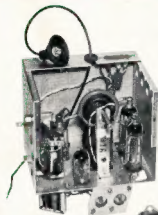
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EDITORIAL



TO REPRESENT OR NOT TO REPRESENT

The report in the July issue of the R.S.G.B. Bulletin on the results of the Stress Conference in Italy brings to notice a matter which is of some concern to your Executive. How is the W.I.A. represented at the next I.T.U. Radio Conference which appears to be scheduled for 1959 with Geneva the likely venue?

It is obvious from the report on the Stress Conference, that Region 1 is well organised, constitutionally and financially, and furthermore, that they will be well represented at the I.T.U. Conference when the time comes. But what of our Region—Region 3? It is certain that everyone will agree that we must have some sort of representation but preferably by a well briefed Amateur and not by proxy. The determination reached at the 1947 Atlantic City Conference made it all too clear that at future Conferences we would have to stoutly defend our hard-won privileges, and with the increasing clamour by commercials and others for more and more frequencies, the next Conference will be an even tougher proposition.

How then is it best to achieve the representation we must have? There are several methods that may be adopted—one of proxy—by briefing say another member society such as the R.S.G.B. who will be present. This method, however, is not entirely satisfactory in that they will have

their own problems peculiar to Region 1 to attend to and could not be fully informed of our attitude to certain problems that may arise. The second method could be a briefing of our Administration's representatives which again could not be entirely satisfactory for the same reasons. A third way might be that one of our members may fortuitously be on vacation in Europe where he may find the time to attend and put our viewpoint.

None of the above methods could be 100 per cent. effective, and the remaining and only sure way of effective representation would be for the Institute to send a fully briefed and accredited delegate especially to the Conference. This, of course, more than any of the other methods, means finance of some magnitude. Your Executive has been considering this problem for some time in an endeavour to find the simplest and cheapest method, but inevitably the finances of such a venture will fall largely on the Divisions. If we are to be effectively represented and if we consider our privileges worth fighting for, now is the time to commence thinking and planning. If we don't face the obvious facts, we cannot but blame ourselves for our apathy and for the often unpleasant decisions made which our united effort of proper delegation may have prevented.

FEDERAL EXECUTIVE.

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Analysis of World-Wide Ionospheric Propagation to and from Australia, 1953-54

BY HANS J. ALBRECHT,* VK3AHH

INTRODUCTION

THE principles of ionospheric propagation have been known for some time and research work during the last two decades has resulted in reasonably complete information on the mechanism of the ionosphere, as far as short-wave propagation is concerned. Predictions of propagation conditions between any two points on this globe are of reliable standard, since the concept of maximum usable frequencies (M.U.F.) and lowest useful frequencies (L.U.F.) was introduced about 15 years ago. For general long-distance communication the present methods are satisfactory for forecasting both frequencies on any circuit. This is, to a large extent, due to the relative consistency of the factors involved. Although readers are, for basic information, referred to appropriate literature^{1,2,3} it is thought that some comments on the fundamental principles of ionospheric propagation are not amiss.

Let us recall that the M.U.F. is defined as the critical frequency, i.e. the maximum frequency reflected back to earth at vertical incidence, multiplied by the so-called M.U.F.-factor. This factor consists of the secant of the angle of incidence, which has to be multiplied by another factor if the curvature in the ionosphere has to be taken into account. The critical frequency of a layer is an indication of the ionisation density. On the other hand, the relative sunspot number has been found to be related to the intensity of the ionising agent of solar radiation, mainly ultra-violet radiation.

The relative sunspot number can be predicted for several months in advance, by using the 11.1-year standard sunspot cycle derived from all previous cycles which have so far been observed. Thus a forecast of conditions can be obtained for any circuit by regarding the lowest value of the M.U.F.s at two circuit control points—about 1,250 miles from each end—as the representative M.U.F. of the entire circuit. This forecast is regularly published in the form of prediction charts for different regions of the world. Each month the forecast of propagation to and from Australia is published in this journal by the Australian Ionospheric Prediction Service⁴.

The L.U.F. can be assumed to be mainly governed by ionospheric absorption, atmospheric noise level, and the power used, and its forecast is more complicated due to the number of factors involved. While it is not intended to discuss this aspect in detail, it may be mentioned that the ionospheric absorption is a function of the ionisation in the ionospheric regions, and that approximate information on the atmospheric noise-level is available from noise charts which are usually drawn on a world-wide basis. Predictions of the L.U.F. are also made available by the Aus-

tralian Ionospheric Prediction Service in the monthly prediction charts.

As indicated above, the propagation predictions produced by prediction services all over the world are accurate enough for normal communication requirements. However, constant checks are essential and investigations into several aspects of ionospheric propagation, not necessarily restricted to communication, continue on a wide basis. Important are observations of ionospheric disturbances and their effects upon the propagation conditions. Other essential research work refers to the actual ionospheric path between the control points of a circuit.

USING AMATEUR OBSERVATIONS

Ever since radio was established as a means of communication, Radio Amateurs have greatly contributed to the progress in this research field. And, referring to the early development, the physicist Heinrich Hertz would not have made his fundamental discovery (1888) without that mixture of scientific skill, experimental knowledge, and technical curiosity, which has always been characteristic of Radio

Amateur lies, as a rule, more in the scientific line. While the problem of communication engineering is the reliable contact between two or more stations, irrespective of the operating frequency, Amateur operators are not restricted in their experiments as long as they confine their transmissions to the bands allotted to them, and do not exceed the power limit.

Particularly important are Amateur DX contests which normally take place on week-ends. With reference to ionospheric propagation research, these are equivalent to "International Geophysical Days", viz.: days on which numerous propagation observations are performed on a world-wide basis. The evaluation of such a contest is of unquestionable value for research, because the entire short-wave range is usually covered.

Another advantage of using Amateur observations is the fact that the experienced DX operator is able to observe the existence of propagation down to very low signal levels. This is obviously more pronounced with c.w. transmissions which allow intelligible reception even with signals much weaker than the minimum signal level required for readable double-side-band telephony.

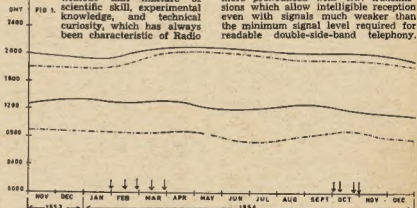


Fig. 1.—3.5 Mc. analysis for Western Europe (top) and North America (bottom), centred on Eastern Australia. Arrows indicate contest dates.

Amateur. And Guglielmo Marconi, who later succeeded in establishing the first contact across the Atlantic Ocean, began his career as an Amateur. In the early 1920's, the discovery of world-wide communication by short waves was a milestone in the history of Radio and of Amateur Radio.

Even today, Amateur observations can be very useful for research, if they are interpreted correctly and compiled appropriately. With reference to ionospheric investigations, a skilled DX operator may have far more experience than research workers who have never had an opportunity to gain practical knowledge. Considering some aspects of ionospheric propagation, careful observations of Amateur DX signals may even provide more useful data than the continuous recording of signals from communication stations, because the in-

terest of the Radio Amateur lies, as a rule, more in the scientific line. While the problem of communication engineering is the reliable contact between two or more stations, irrespective of the operating frequency, Amateur operators are not restricted in their experiments as long as they confine their transmissions to the bands allotted to them, and do not exceed the power limit.

Nevertheless, disadvantages are also encountered when using Amateur observations for research work. Amateur Radio being a hobby, the Amateur cannot be expected to be active at times unsuitable to him, unless he has special interests in propagation investigations. This limited activity must be taken into account when evaluating Amateur reports. Thus few Amateurs operate between midnight and 0600, local time. On the other hand, on week-ends the activity reaches a peak. However, shortcomings of this kind do not exist during contests, and this is one reason for the usefulness of DX contests.

Another disadvantage may be the lack of understanding in certain Amateur

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circles. But Amateurs who are interested in DX work and keep in touch with this branch of Amateur Radio will usually be found to be enthusiastic and reliable co-workers. Speaking of reliability, there is no reason why there should be any difference in reliability between reports of human research workers and those of human Amateur operators.

PROPAGATION ANALYSIS

Making use of his position as DX-Ed., the author felt that a useful contribution could be made to ionospheric propagation research by an analysis of world-wide propagation conditions to and from Australia, based on observations by Radio Amateurs located in all parts of Australia. From the standpoint of research, the conditions during the sunspot minimum are of particular interest, because they make it possible to separate, to some extent, the different factors involved which at other times overlap each other. The last sunspot minimum having occurred around April/May 1954, this analysis covers the period from November 1953 to December 1954.

As a check of predictions during this period is one of the main tasks of the analysis, the predictions published by the Ionospheric Prediction Service are used as a basis of discussion, as long as forecasts were available for the band concerned. It must be mentioned that these predictions are expected to be correct for fifty per cent.

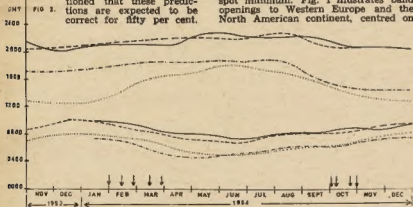


Fig. 2.—7 Mc. analysis for Western Europe, centred on Eastern Australia; short path (top) and long path (bottom). Arrows indicate contest dates.

of the days during a month. Small discrepancies can therefore be explained. The analysis charts show the annual variations of conditions towards certain continents, the axes representing the time in G.M.T. and the months, respectively. This is the usual type of presentation when long-term research work is involved. It allows an examination to be made of conditions during the entire period under discussion.

The openings shown are based on the propagation reports published by the author each month. This monthly report in fact results from the evaluation of reports received from Radio Amateurs, in addition to observations at VK3AFH, and covers the month in question. Different kinds of curves have been utilised to present the results, namely:

Commencement of opening, observed: ————

End of opening, observed: ————

Commencement of opening, predicted: - - - - -

End of opening, predicted: - - - - -

Ionospheric disturbances have not been taken into account as we are primarily concerned with an evaluation of overall propagation conditions. Likewise, sporadic E openings have not been considered, which is quite permissible as long-distance propagation within the range 3 to 30 Mc. is not supposed to be greatly affected by sporadic E.

With regard to the above-mentioned importance of DX contests, the dates of the following DX contests are indicated by arrows in the analysis charts: B.E.R.U., A.R.R.L., V.K./Z.L. and "CQ" World-Wide.

THE 3.5 Mc. BAND

Conditions on this band generally depend on ionospheric absorption and noise, and are thus controlled by the L.U.F. Openings can only be expected when the ionisation density has reached a sufficiently low value. It may be added that overseas conditions on this band are said to be affected by the sunspot activity insofar as the communication is more reliable during the sunspot minimum. Fig. 3 illustrates band openings to Western Europe and the North American continent, centred on

impossible, although New Zealand stations were capable of hearing and contacting European stations without difficulty. As an Amateur station on Macquarie Island also reported hearing European stations over the long path. As 80 metre openings depend on the absorption in the ionosphere, these observations seem to confirm that, at the time concerned (around 0800-0900z), the ionospheric absorption was still too high in Easterie Australia.

THE 7 Mc. BAND

Due to the conditions prevailing during the sunspot minimum, this band was rightly regarded as the Amateur band with the most reliable and consistent conditions to all parts of the globe. Although analysis charts are conclusive for propagation conditions to all continents, the chart published in Fig. 2 refers to long-path and short-path openings to Western Europe only. The chart is again centred on Eastern Australia. As conditions generally were in agreement with predictions, other charts would only use up valuable space. The upper and lower sets of curves indicate openings on the short path and long path, respectively.

Discrepancies between predictions and observations may be explained as follows. As mentioned above, Amateurs cannot be expected to keep a constant watch on bands between 0000 and 0600 local time, which, for Eastern Australia, corresponds to 1400-2000z. This means that the commencement of the short-path opening as observed may not be entirely representative of the real time. The end of this opening shows a fair agreement between predictions and observations. Predictions and observations of the long-path opening follow the same pattern throughout. However, the months January to June 1954 indicate a period longer than predicted, this effect being pronounced during March, April, and May. It must be remembered that the predictions are supposed to be accurate for only fifty per cent. of the days in a month, and that L.U.F. forecasts are more complex and, to a certain extent, less reliable than other factors. Unless one likes to correlate this discrepancy with the actual sunspot minimum, which occurred in April, it may be explained by the fact that skilled DX operators are capable of hearing stations when normal communication has ceased because of weak signals.

THE 14 Mc. BAND

Throughout the period under review, the propagation conditions on this band were not as reliable as at other times of the sunspot cycle. However, each month's contacts were possible with all continents. To illustrate the behaviour of world-wide propagation, analysis charts in Figs. 3 and 4 depict conditions to the North American continent, centred on Eastern Australia and Western Australia, respectively. No distinction was made between long and short path, or between North-East and North-West U.S.A. In other words, the curves result from combining the three prediction charts (or two for Western Australia) published each month for U.S.A. conditions.

Referring to Fig. 3, periods of openings observed are not indicated by two lines because this would undoubtedly

Eastern Australia. The upper curves depict the short-path opening to Western Europe, while the lower curves indicate the period of North American conditions. Openings to other parts of the world were found to be somewhat inconsistent and are therefore not conclusive enough for a useful analysis. A comparison between predictions and observations is possible because predictions were not available for this band.

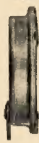
This analysis chart is largely based on the author's own observations and overseas contacts, which amounted, during the period November 1953 to December 1954, to more than ninety with stations in North America, on Eastern Pacific Islands, and in Western Europe.

It is of interest to note that long-path openings between Western Europe and Eastern Australia were found to be

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Output Level = -45 db (0 db = 1 volt/dyne/cm²)
Impedance = Model 1XA Grid 1 — 5 megohms.



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confuse the charts. Where Amateur observations indicated conditions to the North American continent on any path, these times are marked by points. Again explaining minor deviations by the limitations of ionospheric predictions, the following discrepancies invite some comment:

- (1) The observations of conditions after the predicted closure of the band around 0500z, during the period December 1953 to March 1954.
 - (2) Break-throughs around 1300-1500z and 2000-2200z in May 1954.
 - (3) Break-throughs around 0800-1200z in October and November 1954.
- (1) appears to indicate that the M.U.F. over the short path was actually higher than predicted during the period men-

Due to space being limited, the author intends to publish and discuss other 14 Mc. analysis charts at a later date. For the same reason, the 21 Mc. band will not be dealt with in this article.

THE 27/28 Mc. BAND

According to the predictions, openings should have been limited to the Far East during March/April and to North America in April.

Observations of Radio Amateurs indicated that break-throughs existed on these dates:

- 3rd January (Far East only)
- 22nd February
- 22nd to 31st March
- 5th to 13th April
- 20th October (to Europe, 1130z)

These results were to be expected for the period of minimum sunspot activity.

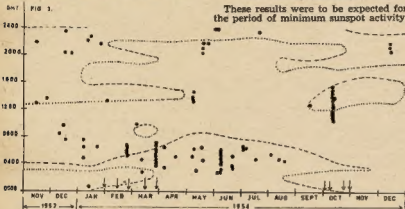


Fig. 3.—14 Mc. analysis for North America, centred on Eastern Australia; points show typical distribution of observations. Arrows indicate contest dates.

tioned, unless all observations refer to sporadic break-throughs above the M.U.F.

Referring to (2), the break-through observed around 1300-1500z probably means that the peak in the M.U.F. noticeable during the same period until April in fact extended to the beginning of May, which is within the accuracy of predictions. As to the other opening (2000-2200z), the actual reports suggest that this was a short-path opening, indicating that the L.U.F. was perhaps predicted to be slightly too high.

As (3) refers to signals from North-East U.S.A., it could be explained by the band opening much earlier than predicted for the short path (1200-1600z). However, the M.U.F. rises rather sharply at that time, as shown by the monthly prediction charts. Unless these signals were due to some sporadic opening, they may have come over the long path with the L.U.F. somewhat lower than predicted.

Fig. 4 shows the analysis chart centred on Western Australia. Throughout the period under review in this article, the number of reports from Western Australia has unfortunately been so small that any evaluation for this area does not appear to be conclusive. However, the few reports received did not indicate any break-throughs at extraordinary times. Thus propagation between Western Australia and the North-American continent can be assumed to have been within the times predicted.

GENERAL CONCLUSIONS

Apart from the few discrepancies observed by Amateurs and discussed in this article, conditions during the period under discussion were in reasonable agreement with the predictions made available by the Ionospheric Prediction Service.

In addition to serving as a general check for predictions, this evaluation of Amateur observations during the sun-

spot minimum promises to be of use in the solution of other problems connected with ionospheric propagation research, as indicated in the Introduction. With reference to the ionospheric path between the control points of a circuit, for instance, the observations seem to confirm the opinion that the so popular and simple concept of multi-hop transmissions is no adequate explanation. It would, however, be beyond the scope of this article to discuss this aspect in detail.

Furthermore, this analysis has again confirmed that Amateur reports are sufficiently reliable for the type of research work mentioned. For the information of Amateurs interested, these are the data of particular importance: time, date (approximate date in the month is sufficient, unless short-term fluctuations or disturbances are the subject of investigation), call sign, signal strength (not essential), approximate beam direction (not essential, but desirable), and comments on anything unusual with regard to the signal observed (presence of fading, i.e. slow or flutter fading, echo, etc.). As shown in this analysis, observations of signals outside the openings predicted are of special interest. The predictions are published regularly in this journal, and instructions for their use were published some years ago⁽⁴⁾.

In view of the International Geophysical Year 1957-58, it would be advisable to hold a larger number of DX contests. In the opinion of the author, DX contests give a unique opportunity of investigating propagation problems, as mentioned earlier in this article.

ACKNOWLEDGMENTS

The author wishes to acknowledge the consistent co-operation of the Australian DX fraternity, particularly the Amateurs mentioned in the DX column 1953 and 1954. Without their reliable reports, the compilation of monthly propagation reports and this analysis would not have been possible.

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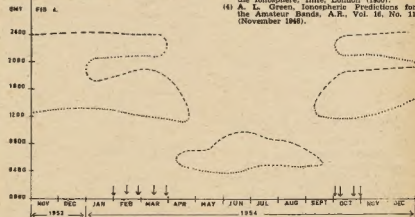


Fig. 4.—14 Mc. analysis for North America, centred on Western Australia. Arrows indicate contest dates.

PULSE THEORY

PART TWO

BY I. F. BERWICK,* VK3ALZ

RE-ORIENTATION

When a train of square pulses is applied to a CR network, due to the exponential rate of charge and discharge, the output voltage E_r cannot follow the supply voltage E_b (see Fig. 6a). What happens is that on the make of the pulse, E_r rises to only a certain percentage of E_b , and on the break E_r goes $-ve$ by a certain percentage. With succeeding pulses this results in E_r settling down to a.c. voltage about the datum.

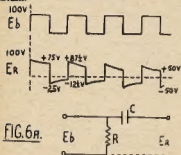


FIG. 6a.

This process is called **re-orientation** and is a nuisance in many circuits. The process of overcoming this is called **a.c. restoration**.

The circuit functions as follows: While the pulse is present C charges and voltage on the cathode of the diode rises. Current cannot flow in the diode.

However, when the pulse ends the cathode goes $-ve$ to earth due to differentiation and hence the diode conducts, and the cathode voltage tends to rise, counteracting the drop-down. The mean output is therefore the same as the input (see Fig. 6b).

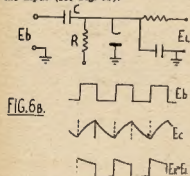


FIG. 6b.

It is now proposed to deal with circuits used for generating pulse waveforms of different shapes.

SQUARE PULSE GENERATORS

Diode Clippers, unbiased (Fig. 7a) and biased (Fig. 7b), give only a rough approximation to a square wave.

Double Clipping combines both the negative and the positive clipping to get a closer approximation to a square wave (Fig. 7c).

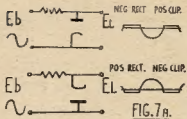


FIG. 7a.

MULTIVIBRATORS

Free-Running or Self Excited (Fig. 8a) plate coupled, called the Eccles-Jordan circuit. Oscillations are started by a minute voltage at the grid of one of the tubes, say a positive voltage on the grid of V1. This voltage is amplified by the two tubes and re-appears at the grid of the first tube, to be re-amplified. This process is rapidly repeated a number of times so that grid voltage of V1 rises almost instantly to a positive value, while the grid of V2 just as suddenly becomes more negative than cut-off. The immediate result is that amplification ceases and for the moment one tube is drawing a heavy plate current while the other tube draws no plate current.

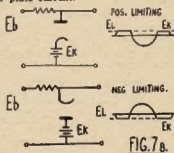


FIG. 7b.

At this stage the leakage through the grid resistance R_{g2} gradually brings the grid potential of V2 back to normal. Refer to (d) in Fig. 8a, the voltage rising exponentially with a time constant $R_{g2} C_2$. When the grid of V2 rises above cut-off this tube conducts and rapidly saturates whilst V1 is just as rapidly cut-off, due to the negative bias applied through C1.

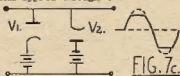


FIG. 7c.

When amplification ceases the grid of V1 charges exponentially with a time constant $R_{g1} C_1$ as in the case of V2. Refer to (b) in Fig. 8a. The process is therefore repetitive and continuous.

Cathode Coupled (Fig. 8b): The process is started by a random voltage on the grid of one of the tubes, causing V1 (say) to conduct and the negative going voltage on V1 plate is applied to

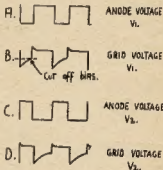
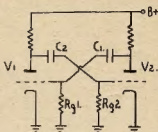


FIG. 8a.

V2 grid via C. The cathodes of V1 and V2 are strapped together so that this $-ve$ bias on V2 is applied as a $+ve$ bias to V1 which thus rapidly saturates and V2 just as rapidly cuts off. V2 being driven far beyond cut-off.

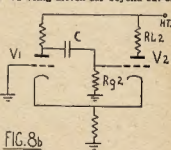
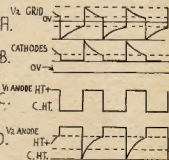


FIG. 8b.



* Lot 35, Loongana Avenue, Glenroy.

At this stage amplification ceases and C charges up through R_{g2} with a time constant CR_{g2}.

Note also that the cathodes of both tubes go slightly less +ve due to the counter action of the increasing plate current of V2 and the decreasing plate current of V1.

The cathodes remain at a constant potential until V2 grid rises above cut-off and the tube conducts. At this stage V1 cuts off and V2 conducts, but not as heavily as V1 did, so the result is a jump in cathode potential. The conductivity of V2 being limited by RL₂. When amplification ceases and the condenser C discharges exponentially through R_{g2} (but since the bias on V2 grid is also affected by the cathode potential) it will be seen that V2 grid potential falls in a linear fashion due to the cathode potential falling exponentially with a time constant CR_{g2} and an anode potential rising exponentially with the same time constant. When the cathode potential falls to such a level that V1 conducts, the process repeats.

It is of interest to note that the linear fall of voltage on V2 grid could be used as a linear time base in certain applications.

The cathode coupled m.v. is to be preferred to the plate coupled type, being more stable.

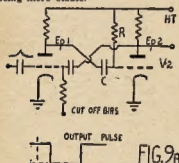


FIG. 9a

Triggered Multivibrators (Flip-Flops)

These are not free-running, i.e. not self-excited, but require a trigger pulse to initiate the pulse generating action.

Two definitions are in order at this stage. For purposes of application two important types of pulses are recognised.

(a) **Trigger Pulses:** These cause a chain of events to occur but have no control of the cycle of events once this has been started. They are usually of short p.d.

(b) **Gating Pulses:** These cause a chain of events to occur but the cycle of events ceases when the gating pulse ceases. They are usually square pulses of appreciable p.d.

Plate Coupled Flip-Flop (Fig. 9a): The grid of V2 is returned to h.t. through R. This holds V2 at saturation. V1 is at cut-off. A trigger pulse is applied to the grid of V1 and this overcomes the bias and plate current flows. The negative going voltage on V1 plate is applied to V2 grid through C and V2 plate current decreases and Ep₂ rises, thus driving V1 grid more +ve. Thus V1 rapidly saturates and V2 cuts off. At this stage amplification ceases and C charges exponentially through R until V2 grid rises above cut-off and

V2 conducts, finally rising to saturation, whilst V1 cuts off and as there is no means whereby V1 grid can rise above cut-off, the cycle now ceases until a further trigger pulse is received.

Cathode Coupled Flip-Flop (Fig. 9b): Initial operating conditions—V2 is conducting and due to resultant bias across R₂, V1 is cut-off. The positive trigger pulse applied to the grid of V1 should always find this tube in the cut-off state.

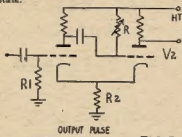


FIG. 9b

The +ve pulse applied to V1 raises the grid potential of V1 above cut-off. V1 therefore conducts and the V1 plate voltage decreases and this -ve going voltage is applied to V2 grid through C, the plate current of V2 then falls and so does that of V1 and hence V1 bias falls below cut-off and V1 conducts. This continues until V1 saturates and V2 cuts off. C now charges exponentially through R, thus permitting V2 to conduct again.

The plate current of V2 through R₂ raises the cathode potential of V1 and the grid of V1 becomes more -ve. V1 plate voltage is therefore +ve going and this being applied to V2 grid, causes this tube to saturate rapidly. The multivibrator remains in this condition until the next trigger pulse is received.

Note that R is made variable. This enables the p.d. of the output pulse to be varied as desired.

Flip-flops are largely used as gating pulse generators.

Note also that the circuit could be triggered at the grid of V2 by a -ve trigger.

Linear Sweep Generator, commonly known as linear time bases.

Introductory Note: In an oscillograph the time base voltage is a sawtooth waveform. This t.b. voltage is a function of time, i.e. at any particular instant the t.b. voltage has a particular value and the horizontal position of the spot on the screen is related to the t.b. voltage and therefore to the time.

For a general purpose oscilloscope, such as is used in Amateur work for

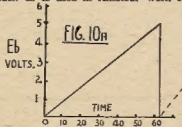


FIG. 10a

modulation checking, it is not important to know the relationship between time and t.b. voltage.

However in a radar scope it is very important to associate the horizontal position of the spot on the screen, i.e. the t.b. voltage with the time elapsed from zero time. To do this it is most valuable to have a linear relation between the time and time base voltage, i.e. $V = k t$, where k is a constant. Such a relationship is illustrated in the graph (Fig. 10a).

CIRCUIT OF TIME BASES

Neon Tube Time Base, non-linear (Fig. 10b). The neon flashes at 100v.

By using a high voltage source (1000v.) and a low voltage neon (100v.) only a short portion of the charging curve (exponential) is utilised and thus an approximation to linearity can be obtained.

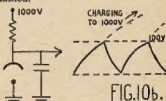


FIG. 10b.

Gas Triode, non-linear (Fig. 10c). When the h.t. is applied the condenser charges exponentially. At a certain voltage on the anode the gas ionises and the condenser discharges through the tube. The variable resistor in the cathode permits adjustment of the point at which the voltage on the anode is sufficient to cause ionisation.

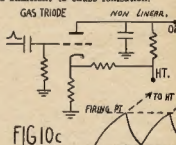


FIG. 10c

This type of sawtooth generator has a time base frequency limit of 50 Kc., whereas hard tubes can produce frequencies of 20 Mc. In practice, this type of circuit is generally locked to some other circuit by firing the tube by means of a pulse on the grid.

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Duties: Assist in maintenance and operation zone and out-station radio equipment.

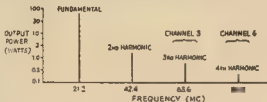
Understanding Television Interference:

BY LEWIS G. MCCOY, WHICP

WHILE TVI (television interference) need not necessarily be a problem for every Amateur, the newcomer should have more than a nodding acquaintance with the subject. The purpose of this article is to discuss the various aspects of television interference and how they affect the Amateur.

So far as Amateur Radio is concerned, TVI falls into two categories. One of these is interference due to faults in the Amateur's equipment. In the other, the television receiver is to blame. Let's discuss the Amateur's equipment first, because in the event of a TVI complaint one should be certain his station is not at fault. The prime cause of interference from a transmitter is harmonics. There are a few others which we'll discuss later, but by far the most important is the radiation of undesired signals that fall in the TV channels.

★
Fig. 1.—Sketch showing the relationships of a 21 Mc. signal and its harmonics. In actual practice the harmonics usually do not have the amplitudes shown. The important point to remember is that in addition to the fundamental, there are harmonics present.



★
HARMONIC INTERFERENCE
What is a harmonic? Let's say that you are operating your rig on 21.2 Mc. According to the design of the transmitter, it is quite possible that in addition to the fundamental signal, you'll be sending out signals that are multiples of your fundamental frequency. This is shown in Fig. 1. The strength of these harmonics will depend on many things, and it is a matter of considerable concern when one or more of them is strong enough to interfere with television reception.

Let's take the case where you are operating on 21,200 Kc. and your local TV service is Channel 3, which is 60 to 66 Mc. Because it's the nature of the beast, the TV receiver needs this entire frequency range of 6,000 Kc. just to see one channel. Any signal other than the TV signal appearing in this frequency range can cause TVI. The reason we say "can" is because it is entirely possible that the TV signal will be strong enough to over-ride the interfering signal completely. However, when the third harmonic of 21.2 Mc., which is 63.6 Mc., happens to meet up with a weak Channel 3 signal, the result is TVI. Your neighbour immediately yells, "That blankety-blank hum next door is ruining my TV!" And, in this case, he's right. You have no business putting out a signal in Channel 3.

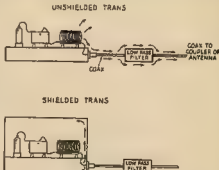
The first step in checking harmonic interference is to find out if the transmitter causes TVI without the antenna system connected. Remove the feedline from the transmitter output terminal and connect a dummy load, such as a

light bulb, to the rig. Now load up the transmitter and check to see if the interference has disappeared. If it has, you can then be reasonably certain that the harmonic is not being radiated from the transmitter. Obviously, it was fed up the feedline to the antenna and then radiated. It is entirely possible that by using an antenna coupler (assuming you don't have one at present) the harmonic will be attenuated to a point where it no longer interferes. If the reader is unfamiliar with the construction and use of antenna couplers, it is recommended that he read the section on couplers in "The Radio Amateur's Handbook." In addition to the Handbook, a description of an antenna coupler for the Novice is given in the April 1955 issue of "QST."

If the antenna coupler doesn't do the job, then more drastic action is needed.

The best method for preventing harmonic radiation is the use of a low-pass filter. A low-pass filter is simply a device that acts as a gate. It permits your fundamental signal to be fed to the antenna but shuts off the harmonics. The filter is an easy unit to build, and complete details are given in the BCI-TVI chapter of the Handbook.

★
Fig. 2.—In this drawing we see what can happen when the transmitter is not shielded. Without shielding, the harmonics flow over the chassis and on the outside of the coax and low-pass filter. With good shielding, the harmonics must flow inside the coax as there is no other means for them to escape.



★
For a low-pass filter to do its job properly, certain precautions should be observed. Most transmitters these days are designed for use with coaxial cable, the output terminal being a coax receptacle. The low-pass filter should be inserted in the coax line, close to the transmitter. If the harmonics are not being radiated directly from the transmitter but are fed up the feedline to the antenna, the installation of the filter may eliminate the interference. However, if it doesn't there are a few more steps needed to make sure the filter has a chance to do its job. In order for the

filter to be completely effective, all of the transmitter output must be routed to it.

Id the sketch at Fig. 2, we see how the harmonics can reach the antenna without passing through the filter. By shielding the transmitter, the r.f. is forced to pass through the filter to reach the antenna. Other leads that enter the transmitter box, such as the 110-volt and key leads, must be filtered to prevent the harmonics from escaping the box. In obstinate cases of TVI, complete shielding and lead filtering of the transmitter are required. This is particularly true in areas that are quite far from the TV station and when the TV signal is weak. Naturally, the stronger the TV signal, the less one is apt to be bothered by TVI. Here is a summation of the steps to try when combating interference: Try the antenna coupler first; it may be enough. Next, add a low-pass filter. If these two steps don't do the job, then shielding and lead filtering are necessary. You can be reasonably sure that with a shielded transmitter and a low-pass filter, your signal will be clean. If you have a TV set in your own home and it doesn't show interference when your transmitter is running, then it is pretty good evidence that your rig is clean.

TV RECEIVER DEFICIENCIES

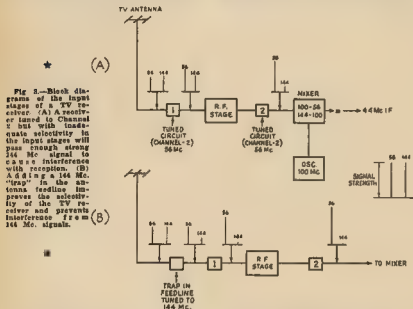
This leaves us with the other problem, that of faulty TV receivers. Let's make one point quite clear concerning TV receivers: interference due to poor receiver design is not your fault. You should co-operate as much as possible with the set owner but, once you know

your signal is clean, the obligation of fixing the receiver is not yours.

A TV receiver is designed to receive the bands of frequencies on which TV signals are transmitted. When the receiver picks up signals from frequencies other than the TV bands, then something is wrong with the set. Usually this something is lack of selectivity. When the TV receiver is tuned to Channel 3, it certainly shouldn't receive your 21.2 Mc. signal. If it does, then it is lacking in selectivity. When the 21.2 Mc. signal overloads the front end of the TV receiver (r.f. and mixer stages),

these stages generate harmonics of the 21.2 Mc. signal. This type of overloading and generation of harmonics gives the same final result as TVI caused by transmitter harmonics. However, in this case, the TV receiver is at fault. The answer to the problem is the installation of a high-pass filter at the receiver. As mentioned before, if your own TV set or one belonging to a neighbor is clean of TVI, then you can be fairly certain the affected set is at fault. Of course, for your own set to be clean, it must have sufficient selectivity to keep from overloading. This may mean the installation of a high-pass filter on the set.

Just like a low-pass filter, a high-pass filter acts as a gate. When installed on the TV receiver it permits the TV signals to enter but shuts out lower frequency signals. However, the installation of a high-pass filter on the neighbor's set is not your responsibility.



committee, then the procedure would be to write the F.C.C. and explain the problem to them. They will take whatever action is necessary for the installation of filters.

It should be pointed out that in order for a high-pass filter to do its job properly, it should be mounted directly at the tuner of the TV set, not on the antenna terminals at the back of the set.

TWO METRE IMAGE INTERFERENCE

There is one type of interference that the 2 metre operator living in a Channel 2 area is likely to encounter. It is "image" interference in TV receivers having a 44 Mc. intermediate frequency. While this type of interference is a fault of the TV receiver, the Amateur should know what it is if and when he encounters the trouble. If you don't know anything about receivers you'll probably wonder how in the world a signal

Both signals, plus the oscillator signal, are then fed into the mixer stage. The action in a receiver mixer stage is to shift the frequency of the incoming signal to another frequency (the i.f., or "intermediate frequency") where it can more conveniently be amplified. This is done by introducing a "local oscillator" signal; the incoming signal will be shifted to frequencies corresponding to the sum and the difference of the two frequencies. In the case shown in Fig. 3A, the frequency relationships are such that the 100 Mc. oscillator signal shifts both the desired TV signal and the undesired Amateur signal to the 44 Mc. i.f. If the receiver does not have sufficient selectivity to reject the 144 Mc. signal, it is quite possible for

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in the 144 Mc. band could interfere with a TV receiver tuned to Channel 2 (54 to 60 Mc.). Without going into a long discussion on how a receiver works, we'll try and explain what happens. In Fig. 3, at A, the signal input circuit of a TV receiver is shown in block diagram. To keep the explanation as simple as possible, only two signals are shown in the diagram, at 56 and 144 Mc. Actually, there will be a multitude of signals from the antenna reaching the first tuned circuit in the receiver. The tuned circuit should accept signals at its resonant frequency and reject signals at other frequencies. The degree to which the undesired signals are rejected will depend upon the sharpness, or "selectivity," of the tuned circuit.

You will note in the diagram that the 144 Mc. signal is not as strong as the 56 Mc. one after they pass through Circuit 1. Both signals are amplified by the r.f. stage and then passed through Circuit 2. The 56 Mc. signal is now much stronger than the 144 Mc. one.

HANDLING TVI COMPLAINTS

The first thing to do on being informed that you are causing TVI is to contact the complainant and explain what is happening to his set. Assuming that your station is clean, you are in a position where you know his set is at fault. If your radio club has a TVI committee, and many cities have such organisations, give the complainant the name and phone number of the committee. By all means let the committee handle the complaint. It is not only equipped and trained for such work; it is authorised by the F.C.C. to take whatever action is necessary to settle the complaint.

Many TV manufacturers are aware of the need for additional selectivity when their receivers are used near a short-wave transmitting station. Upon recommendation by an authorised TVI committee, or the F.C.C., the manufacturer will furnish a high-pass filter at no charge to the set owner. If you are in an area not serviced by a TVI

the signal to interfere with the 56 Mc. signal. However, the cure is simple.

At B, in Fig. 3, we see what happens when a trap (see Handbook chapter on TVI-BCI for constructional details) is installed in the feedline of the receiver, to improve the selectivity of the receiver. The trap is tuned to 144 Mc. to reject the interfering signal. After the two signals pass through the trap (the 56 Mc. signal is not attenuated by the trap), the difference in amplitude between the two signals is so great that the 144 Mc. signal no longer interferes.

As pointed out earlier, it is not your fault that the TV set picks up your signal. The cure for the problem is a 144 Mc. trap installed at the antenna terminals of the TV set. Explain the problem to the set owner and let him know that you'll be happy to tell the TV serviceman how to correct the interference. It is not recommended that the Amateur do any work on a neighbor's TV set. Installation of filters and traps should be left to a TV serviceman. The best procedure is to maintain a hands-off policy, because if something happens to the set after you have worked on it, you'll be blamed.

If you want to add a high-pass filter to your own TV receiver, details of its construction and installation are given in the TVI chapter of "The Radio Amateur's Handbook."

In summing up, the following points should be mentioned. It is much easier to clean up 80 and 40 metre harmonics than it is those from 15 metres. In most cases, the use of an antenna coupler will furnish adequate harmonic attenuation for 80 and 40 metres. Remember that when a TV set owner gets interference from you, he doesn't know that h.s. set can be at fault. And, as a matter of fact, he'll probably take a dim view of your telling him his set is to blame. You can readily see that a great deal of diplomacy and tact on your part is required to keep relations on a friendly basis. It's nice to know you're right—but don't be smug about it!

Low-Pass Filter Home-Building Simplified

BY H. F. RUCKERT,* VK2AOU

A Low-Pass Filter was described in the November 1955 issue of "A.R." Further tests with this filter type, various coils and checking the tuning, resulted in the experience that correctly wound coils may be used without having to go through the alignment procedure described in "A.R."

The coil winding is simplified by using standard drills as the winding former. With transformer copper wire No. 14 s.w.g. the coils will have just the right diameter from wire centre to wire centre, or outside coil diameter minus one wire diameter. The length is the full length of the winding. Add half an inch to two-thirds of an inch of coil wire length for the wiring.

The capacitors (ceramic or silver mica) should be of plus or minus 10% tolerance. Small receiver types (500v d.c. working) are safe if your s.w.r. ratio on the line is not much higher than 1:2. Co-axial cable of 50 to 70 ohms may be connected on both filter sides.

The filter must be very well bonded to the transmitter chassis.

The cut-off frequency is again 35 Mc. up to 41 Mc.

Coil Lk and the two L1 coils are wound on a 31/64 inch drill.

The coils L2 are wound on a 25/64 inch drill.

The coils will open up to the right diameter.

Lk—11 turns, 0.57" diam., 0.95" long

L1—8 " 0.57" " 0.71" "

L2—8 " 0.47" " 0.75" "

The coils should be mounted at least the coil diameter away from other components and the shielding.

* 25 Berrille Road, Beverly Hills, N.S.W.

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THE ANSWER IS A HAM

BY R. S. FISHER,* VK3OM

In these enlightened times explanations are seldom necessary. Imagine my surprise, when quite recently I was flung into a whirlwind explanation through the failure of my circle of acquaintances to appreciate or even to understand the real and inner significance of the word "HAM".

Webster, with unusual inaccuracy, gives it as the name of a portion of the pig after decease. And this, no doubt, is responsible for the erroneous belief that it is of Semetic origin and goes with eggs, generally in the morning, but never on Friday.

I myself had thought that this ancient meaning had fallen into desuetude about the time John came out of the wilderness, and can only marvel at the way some words still cling to their derivations. Of course, even today one cannot help but recognise that some "hams" are pigs (like our friend 3OM, as related hereunder), but prefer to believe that this is merely a recent colloquial or metaphorical addition to the etymology of the word and in no way connected with its source.

Any attempt, however, to counteract this parlous state of public ignorance I find is an exhausting exercise in metaphysics. The briefest possible connotation is that the "Ham" is the product of a peculiar state of mind manifesting itself in the pursuit of the intangible. Fortunately for himself, the "Ham" is in his appearance no different from other members of the human species. Unless, of course, one is acute enough to observe a slight trembling of the right forefinger and thumb, although even this is not an invariable clue, since many prefer to use the left foot.

Like most wild animals (to which he is probably related), the "Ham" is harmless, and does not betray his natural tendencies until within his own domain. This is generally a mildewed shack, which does not leak, except on wet days, and for comfort and vague hints of mysterious sorcery resembles the anchorite's cave. In the dimmest corner of this place against a background of remarkable wallpaper and "Danger H.T." notices is a general junk pile marked variously "Smitters" and "Roxer," which he indicates with casual indifference to the wondering uninitiate as being the "outfit with which he created the Finland-Australia low power phone record." To a fellow "Ham," however, who has thought up enough lies to make a visit worth while, he boasts pridefully of having collected it less fifty through his personal influence with Mr. So-and-so of Such-and-such famous radio concern.

Here before this junk pile he sits far into the night. Tiny noises break the silence, and the demonical expression and subdued mutter of his lips in the faint light of his 807 is sufficient to frighten the ghost of Bluebeard. Should

one such dare to disturb him, even though it be only in the act of reaching down for another Sao biscuit, he would be met by a nicely-worded store of invective, educated by a life of seclusion, exceedingly varied, and well arranged without repetition.

Such is the "Ham" in his natural habitat. In summer these nightly vigils are prevented by what is known as QRN, with any given number of the abovementioned adjectives preceding it. In this weather he simply talks, and herein lies the great tragedy of the "Ham." None but his fellow "Ham" can understand him.

Perhaps in order to illustrate this sad condition I had better give that famous instance, when 3OM met 3AFJ (it is one of the peculiarities of the "Ham" that they have not names in the ordinary sense, but merely call signs) in front of the W.I.A. stand at the last "All Models Exhibition."

3OM was escorting a young lady, but at that moment had forgotten her existence in an absorbed study of the exhibit. 3AFJ, bouncing up at that moment, slapped him on the back and cried, "Hello, I see you brought her along OM."

"You bet—I'm running 'er heavy right now—bit expensive on the juice

though." (3OM generally had trouble with his aspirates.)

"I heard her perking the other night. Rather raw note. Hi!"

"A bit noisy," admitted 3OM. "I've to see what I can do to stop 'er hoscillating with the locals. She's rather loud, but I'll tone 'er down when I get to know her better. She's a bit sluggish on long distances. Good speech, but with music she always seems a trifle flat, and I'm not keen on her speaker."

"Don't think much of that dial, OM. Bit wrinkly, and must take a lot of keeping clean. In fact, she could do with a clean all over."

"Oh! well, what can you hexpect, considering the way she's been knocked about here—that's the worst of bringing them to a radio exhibition. I s'pose she'll squeal when I get her 'ome again until I get her working again. I'll try your suggestion and see what choking will do."

3AFJ then bounded off with cheery 73 in his usual bright manner, and left 3OM facing an irate and red-faced young lady. Tears of rage sprung to her eyes, and she stamped her foot and gazed at the amazed 3OM.

"You Pig! Pig! Pig!!!"

"Why, why, hi'm not a pig, only a Hamateur Hexperimenter."

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R.S.G.B. TELEPHONY CONTEST

UNITED KINGDOM VERSUS THE REST ON 21 AND 28 Mc

The first-ever R.S.G.B. contest exclusively for telephony operation and open to stations throughout the world is to be held on November 24-25, 1956. Its aim is to encourage stations to operate on the 21 and 28 Mc. bands during the years of high sunspot activity. Contacts with any station in the British Isles with any station in the rest of the world (including Europe) will count for points—the first time, incidentally, that any R.S.G.B. contest on these lines has been arranged.

The contest runs for a straight 36 hours but, since these bands will almost certainly close during the night, it is anticipated that activity will be confined mainly to the daylight hours of the Saturday and Sunday, and should thus prove particularly attractive to those who find most DX contests unduly arduous.

The availability of the two bands should enable Amateurs whose second harmonics fall in local TV channels to operate on at least one band at any time throughout the contest. High- and low-power sections will be run concurrently.

A simple scoring system has been adopted: 5 points for each completed contact, with an additional bonus each time a new country is worked. Countries will be defined in accordance with the official list (as used for DXCC) ruling at the time of the contest with the following exceptions: in VE, VK, W (K), ZL and ZS the call areas will each count as a separate country (e.g., it will be possible for a U.K. station to obtain bonus of 200 points by working all the ten call districts of the United States).

It is suggested that participants should call "CQ RSGB." Overseas stations should note that the maximum possible number of British Isles zones providing a bonus of 50 points is 36 (six prefixes each with six numbers).

RULES

1. The contest is open to licensed Amateurs in any part of the world.

2. The contest is divided into two sections, namely (a) low power—maximum input 25 watts, (b) high power—maximum licensed power.

3. The contest (both sections) will start at 0700 GMT on Saturday, November 24, and end at 1800 GMT on Sunday, November 25, 1956.

4. Any type of telephony transmission for which the station is licensed may be used, e.g., AM, NBFM, SSB, etc.

5. Only the entrant will be permitted to operate the station for the duration of the contest.

6. Entries must be set out as shown in the example below, using one side of the paper only. Entries must be post-marked not later than December 10, 1956, and must be addressed to R.S.G.B. Contests Committee, New Ruskin House, 28/30 Little Russell Street, London, W.C.1. The closing date for acceptance of entries is January 31, 1957.

7. Entrants must operate within the terms of their licences.

8. Only one contact per band with each station will count for points, but duplicate contacts should be logged. Cross-band contacts are not allowed.

9. Overseas stations may only claim points for contacts with British Isles stations (G, GC, GD, GI, GM, GW). British Isles stations may not work each other for points.



"I've worked 257 Stations—seven hours still to go . . ."

(Suggested by R. Robertson, N.E.)

10. For each completed contact British Isles stations will score 5 points. In addition a bonus of 20 points may be claimed for the first contact with each new country on each band. For the purpose of this rule the official countries list will apply, with the exception that VE, VK, W, ZS and ZL call areas will each count as a separate country. Overseas stations will score 5 points for each completed contact with a British Isles station. In addition a bonus of 50 points may be claimed for the first contact with each British Isles country-numerical prefix, e.g., G2-, G3-, G5-, GW2-, GM3-, GI5-, etc.

11. Serial numbers must be exchanged and acknowledged before points may be claimed. The serial number of 5 figures consists of the RS reports plus 5 figures which may start with any

number between 001 and 100 for the first contact and will increase by one for each successive contact, e.g. 087 for the first and 088 for the second contact etc.

12. The Metcalfe Trophy will be awarded to the leading British Isles station in the low power section and the Whitworth Trophy to the leading British Isles station in the high power section. In addition certificates will be awarded to the leading station in each section in each of the other five British Isles country-prefix zones, and also to the runners-up in the Trophy winners' zones.

Certificates will also be awarded to the leading stations in each overseas country, VE, VK, W, ZL and ZS call areas counting separately as in Rule 10.

R.S.G.B. 21-28 Mc. Telephony Contest

November 24-25, 1956

Name Section Claimed score

Address Call Sign

Transmitter Input Watts

Modulation system(s) used Receiver

Aerial(s)

Date	Band Mc.	Time GMT	Call Sign of Station Worked	My Report on his Signal	His Report on my Signal	Points Claimed	Bonus Points	Leave blank
24	21	0708	G3XXX	57001	57003	5	30	
24	21	0714	G3ZZZ	56005	56008	5	—	
24	21	0750	GM3YV	55003	57013	5	30	
24	28	0758	54004	56015	5	50		
Total (points claimed plus bonus points) 30 plus 150 equals 170								

Declaration: I hereby certify that I have operated within the terms of my licence and in accordance with the rules and spirit of the contest. I agree that the decision of the Council of the R.S.G.B. shall be final in all cases of dispute. I certify that the input power to the final stage of the transmitter was watts.

Date Signed

CHECK LOGS FROM NON-COMPETING STATIONS WILL BE WELCOMED.

—Reprinted from the R.S.G.B. "Bulletin," May, 1956.

"CQ" DX CONTEST

The Phone Section of this Contest commences at 0200 G.M.T. on 20th October and runs through to 0200 G.M.T. on 22nd October.

Likewise the C.w. Section, 0200 G.M.T. on 27th October to 0200 G.M.T. on 28th October.

ERRATUM

In the article Phone and C.w. Monitor, August issue, p.8, the leads to the battery should be reversed.

AMATEUR CALL SIGNS

FOR MONTHS OF JUNE, JULY, 1956

NEW CALL SIGNS

VK— Canberra, A.C.T.
1AB-G Chisholm, 18 Howe Crescent, Ainslie.

New South Wales
2EY-J P. Meachan, 58 Verbruggen Ave., Bankstown.
2GP-D A. Page, 85 Haslam's Wells Rd., Lidgeway.

2HI-B F. Darrogh, 10 Fairmount St., Lakemba.
2LY-W B. Lane, 15 Hyman St., Tamworth.

2MP-M J. Pfeiffer, R.A.A.F., Richmond.
2SU-C B. Jones, Lot 5, Hutchinson St., Redhead via Newcastle.

3VJ-J R. McDonald, 150 Stony Creek Rd., Bexley.

3AAK-A J. Kyle, 64 Wentworth St., Randwick.
3ADZ-G H. Harrison, Farm 1650, Griffith.

3AGW-W N. Short, 55 Auburn Rd., Auburn.
3ZAL-A R. Heunessy, 23a New Hiltwaite Rd., Berkey North.

3ZCB-L B. Barber, 55 Main St., Scone.
3ZCC-L J. Carpenter, Blackbutt Rd., French's Forest.

3ZCG-J W. H. Grace, 27 Davis Ave., Watson Bay.
3ZCM-S M. McGreggor, R.M.B. 31, North Kororo, via Coff's Harbour.

3ZCS-W B. Steinweide, 65 Anzac Pde., Maroubra Junction.
3ZCW-J B. Webster, 26 Bayview Ave., Earlwood.

3ZDL-S G. Lloyd, 104 Main Rd., Kailshill.
3ZDM-J E. Mackie, Mcleworth St., Hillston.

SEA— E. Anderson, 130 Osborne St., Williams-town.
3GB-G P. Butler, to May St., Fitzroy.

3NP-D C. Gell, 97 Panoramic Rd., North Sydney, Balwyn.
3KU-B D. Clarke, Diamond Rd., Eltham.

3WC-P J. Grijg, 3 Phillip St., Geelong West.
3ACQ-B D. Greene, 210 Main St., Ballarat.

3AFB-F J. Bety, 51 Neerim Rd., Caulfield.
3AGF-F G. Anner (F/Bgt), R.A.A.F., Laverton.

3ATK-J B. Kelleher, 3 Palme St., Newport.
3AIT-G C. Trell, Pezarsdale, via Sale.

3AMT-A M. Woolley, 5 Derwent St., Ringwood.
3ARH-P W. Richey, 3 Gwilt St., Ruckwold.

3ASK-J W. Smith, 18 Lochlinvar St., Pascoe Vale South.
3AVB-R K. K. Burbridge, 9 Fushia St., Blackburn.

3AVJ-J E. Lewis, 27 William St., Frankston.
3AVP-F H. Lewis, 27 William St., Frankston.

3ZCF-B S. Fraser, 30 Webster St., Ballarat.
3ZDF-A J. McKean, 423 Buckley St., Essendon.

3ZDH-D J. B. Hull, Larnach Rd., Baxter.
3ZDP-B G. Stowell, 31, Franklin.

3ZDT-P G. Thorne, 51 Princes Highway, Moe.
Queensland

4AP-A. Guldiner, 40 Clayton St., Sandgate.
4JJ-V F. Edwards, 101 Hamilton Rd., Moorooka, Brisbane.

4NI-A. H. Nicholls, 309 Newmarket Rd., Wilsham, Brisbane.
4NT-N H. Lawton, 50 High St., North Mackay.

4ZAK-K T. Robertson, 40 Price St., Belgian Gardens, Townsville.

South Australia
5ZAQ-E J. Whittington, 18 Ralph Ave., West Croydon.

5ZEN-W R. John, 14 Shirley Ave., Woodville West.
5ZCX-W H. Wall, 29 Port Rd., Hindmarsh.

5EH-J B. Hawke, 485 Payneham Rd., Felix-lowe.
5IW I B. Wall, 34 Church Ter., Walkerville.

5ZAL-A L. West, 16 Mahar St., Kensington Gardens.
5ZAM-D A. Carthew, Penola.

Western Australia
6ZAH-L E. Gooding, Dorkan.

Tasmania
7SM-S G. Moore, 8 Pearl St., Wivenhoe, Burnie.

7GC-G B. Cranby, 6 Barrack St., George Town.

CHANGES OF ADDRESS

VK— Canberra, A.C.T.
1AYP-S Penikis, 42 Kennedy St., Kingston.

New South Wales
2CF-J D. Clark, Flat 3, 21 Martins Ave., Bondi.

2CU-A Pearson, 20 Woll Ave., Earlwood.
2HB-L S. Porter, 133 Glipp St., Bega.

2IJ-J N. Delaney, 4 Kippara St., Fyrmble.
2IU-M J. McDonald, 55 Bristol Rd., Hurstville.

3KL-VI. A. Preston, 9 Forsyth St., Ryde.
2MA-A N. Lansley, 18 Warandoo St., Waltham.

2ML-R M. Ellison, 47 Park Rd., Bulli.
2NX-U G. Cameron, C/o. Carrs Creek Junction P.O., via Grafton.

3OT M. D. Sobels, 7 Seaview St., Dulwich Hill.
2PB-M T. Smith, 34 Redgrave Rd., Normanhurst.

2SS-A. Skeen-Smith, 300 Great Western Rd., **Queensland**

2ABP-R G. Dunford, Dalgaroo St., Coona-Barrabool.
2AGH-G G. Hall, 79 Kyla-pd, St. Hurstville.

2AGN-G F. Nixon-Smith, "Benavandah",
2AJ-J R.M.B. 250, Dunkeld, via Bonthurst.

2AJF-J L. Mills, 23 Gomers Rd., Caringbah.
2AIC-C Allen (Major), Eastern Command Signale (N.S.W.), Regiment, Gormley St., Lidcombe.

2AMM-W J. Plant, 54 Bonar St., Maitland.
2AQB-R B. Digby, 12 Beach Rd., Collaroy.

2ARI-R W. Clements, 22 Alice St., Turramurra.
2AVC-E C. Champion, 197 Livingstone Ave., Fyrmble.

2AVF-P Fairleigh, 29 York St., Bondi Junction.
2AW-W H. Field, 45 Charles St., Killara.

2AZG-J R. Grouse, 19 Ivanhoe St., Marrickville.
Tasmania

3DE-D E. Hale, 1 Langford St., Morwell.
3DM-D C. McDonald, 118 Francis St., Ascot Vale.

3FQ-A C. Yeomans, 7 Backie St., Benleigh.
3HW-J L. Lewis, Station, Walker St., Ballarat North.

3TV-W J. Murden, Residence 35H, Swan Hill.
3ARC-E F. Caddy, 229 Main St., Balmadale.

3ABX-V D. Bond, 28 Strzelecki Rd., Yallourn.
3AL-A L. Astler, 8 Marshall Ave., Highbeth.

3ARV-R Henderson, Block 123, The Boulevard, Thomastown.
3AYC-C R. Chugg, 2 Spencer Rd., Cumberwell.

3JWA-Wireless Institute of Australia—2 Norfolk Rd., Surrey Hills.
3ZAW-M J. Williams, 118 Bruce St., W. Coburg.

3ZCV-C. Ewen, 13 Beaver St., Box Hill.
3ZDT-P G. Thorne, 10 Dickenson St., Glenroy.

Queensland
4BM-W J. Mead, Oak St., Gumsdale.

4DC-K D. M. Grice, new fixed station at 579 Lower Bowen Ter., New Farm, Brisbane.

4DN-W E. Evans, Cordella St., Gympah.
4NR-C C. Rounsd, 25 Valence St., Sunnybank.

4SK-G B. St. George, C/o 4MK, Mackay.
4ZAB-C T. Amoco, Minumine St., Stafford.

South Australia
5BF-D G. Goode, amend to read Yankallilla.

5BM-A R. Matthews, 22 Robert St., North Unley.
6CW-W R. Clifton, 33 Kingston Ave., Seacombe Gardens.

5DA-S R. Bucknerfield, 5 Kathleen St., Brighton Gardens.
5DZ-J A. Casey, 41 Tenth St., Port Pirie.

5EE-K T. Walter, 64 Harcourt Ter., Salisbury North.
5IC-P E. Croothwaite, 79 Thomas St., Unley.

5MJ-J H. Micklem, 5 Willaroo Ave., Beaumont.
5RB-B B. Monfries, 74 Park Ter., Parkside.

5RQ-C R. Sellick, 8 Machin St., Woodville S.
5US-P R. O'Connor, 25 Benjamin St., Manningham.

5XA-H K. Stacey, 34 Loader St., Glynde.
5YK-A J. Hewitt, 34 Taylor Rd., Thebarton.

5YL-L Lindley, amend to read Elizabeth.
5ZAN-W J. Goodridge, 65 Farnham Rd., Ashford.

Western Australia
6BN D. A. Elise, 57 Cawston Rd., Attitude.

6PW R. W. Peterson, 11 Olive St., Bilton Park.
6WZ-R R. Atkinson, 51 Middleton Rd., Albany.

6ZAF-T C. Berg, 16 Aberdeen Rd., Shenton Park.
Tasmania

7ZAJ P. J. Edwards, 28 Bala Ter., Launceston.
Territory of Papua and New Guinea

8HO-H T. Overland, C/o R.T.C. Transmitter Station, Lae.
9KW K. W. Turtle, Banjo Plantation, Buka Passage, via Sohma, Bougainville.

CANCELLED CALL SIGNS

VK— Canberra, A.C.T.
1EY-J P. Meachan, New VK2EY.

New South Wales
2AI D E. Mattion.

2BK-J F. Edwards, New VK4JJ.
2BY T. H. Chubb, New VK4JG.

2EJ P J. Grijg, New VK3WC.
2EL-A Nicholls, New VK4NI.

2ER-Z R. Duffy.
2FW T. Dwyer.
2XG-W H. Marshall.

2ZAF A. J. Fisher.
2ADI-J E. Sidler.

2ZAZ-G H. Harrison.
2ZBM-H O. Mathews.

Victoria
3MO-A M. Owest-Alderson.

3PE L. F. Heznes.
3ACQ-G P. Butler.

3ANW-F K. McGottard.
3ASB-P. G. Gooding, New VK4BK.

3AUT-W R. Ross.
3AYY H. G. Woblers.

3ZAC-W T. Jacobs.
3ZCD-D Calwell.

Queensland
4YS-S P. Sorenson.

South Australia
5FG-G Chisholm, New VK1AB.

5VZ-D P. Gooding, New VK1AF.
5WZ-F G. Anner (F/Sgt.), New VK1AGF.

5ZAA-L B. Wall.
Western Australia

6AS-A A. Smith.
6BR-B R. Field.

6KB-V L. Dock.
Tasmania

7BC B. D. Clark, New VK3KU.
Territory of New Guinea

8CW-Wau Radio Club.
8VP-E Penikis, New VK1APF.

PERMITS GRANTED FOR TELEVISION EXPERIMENTS

VK— New South Wales
2DF-T L. W. Cocks.

2OT-T M. D. Sobels.
2YT-T—Sydney Technical College.

2AFB-T F. C. Barron.
2AJA-T A. Mead.

2APX-T J. K. Carter.
2APZ-T E. Piraner.

2ZAV-T G. Fairleigh.
2ZWT-T W. T. Jacobs.

Victoria
3EN-T F. W. Walker.

3LV-T P. F. Moncur.
3QG-T C. P. Smith.

3UR-T R. R. Abbott.
3ABT-T R. N. Abbott.

3AGI-T D. W. Gove.
3AGW-T A. G. Wiley.

3ALT-T L. E. Lloyd.
Queensland

4CG-T C. H. Y. Goo.
4PT-T C. R. J. Paton.

South Australia
5TG-T F. H. Taylor.

Western Australia
6WJ-T W. W. Jacobs.

6ZAQ-T D. A. Mendocroft.
Territory of Papua and New Guinea

9FN-T F. M. Nolan.

WIRELESS INSTITUTE OF AUSTRALIA VICTORIAN DIVISION OLYMPIC GAMES ACTIVITIES

* OLYMPIC DINNER

A special Olympic Dinner is to be held on Nov. 16, 6 p.m. at the Prince of Wales Hotel at St. Kilda.

* STATION VISITS

For the special benefit of Overseas Amateurs visits will be arranged to a number of VK3 Stations.

* FIELD EVENTS

These events will be held in conjunction with Transmitter Hunts on one Sunday during the Olympic period.

Intending Amateur visitors are requested to get in touch with the W.I.A. office, 6th Floor, 191 Queen Street, Melbourne (Phone: MY 1081) after arrival in Melbourne.

S.W.L. SECTION*

Well folk this month I'm afraid I haven't a full roll up of VKs grades, but I still haven't given up hope. Nothing from VK8 this month, but hope to hear something soon. I'd be very interested to hear from someone in VK9 or doesn't anyone read the magazine up there? Surely there's someone in VK1 (A.C.T.) too.

NEW SOUTH WALES

Stan Abbey, Milnes St., Coolamon, N.S.W., writes stating that he has heard very little on the bands lately. He's thinking of putting up a new antenna. Maybe that's the trouble Stan. He and Jack Ashley are still plugging along studying for the ticket whilst the Coolamon Kilwatt 2A/O is, I am told, vigorously supplying the cane. Kick at them Jim OB and you should soon have some more QRM to contend with.

Stan includes news of another VK8 s.w.l. Bill Davey, of Paddington. Bill has been an s.w.l. for about 10 years so no doubt must have quite a few stations logged. He has a line-up of four v's, namely, 14 tube home brew 14 Mc. an HRO-M covering from 1.7 to 30 Mc., a BCMAQ from 200 Kc. to 18 Mc. and a 3BZ for use on the h.c. bands. His antenna is a ground plane for 14 Mc. Thanks for the information Bill and hope to hear more from you. Any other VKs are asked to write to Stan Abbey for notes to be forwarded to me.

VICTORIA

The August meeting of the VK3 Group was held at the rooms on Tuesday evening, 28th. Fred 3Ys very kindly arranged a schedule with Doug 11J on Marquarie Island in the Antarctic. The evening proved very interesting as some 215 Mc. gear was also brought to the meeting. 11J was contacted on 48 mc phone and we had the pleasure of talking to quite a few of the members of the expedition way down there, including the cook. We were treated to a very good description of life in the frozen South and learned, believe it or not, that there are rabbits in the Antarctic. We extend our thanks to Fred and Doug for this very interesting time.

* Compiled by Ian J. Hunt, WIA-L3007, 101 Robert Street, Northcote, Vic.

A contact was also made from the rooms with Gerry 3ZBN at Nunawading a distance of about 18 miles on 1 mc. After all this activity officers for the next year were elected as follows: President, Len Poynter, Vice-Presidents, Michael Ide and David Tanner (2A/T), Sec and Asst Sec, Colin Cook, Treasurer, Ian Hunt, Council Rep., George Robertson.

Coming Events: Don't forget the following: October meeting, Tuesday, 30th, a talk by Len 3ZBN. This meeting will be held at the W.I.A. Rooms, 191 Queen St., Melbourne. Visitors are welcome.

Correspondence: Dave WIA-L3039 from Orkney, sends in details of his log and makes the suggestion that in an effort to keep your log tidy a rough log should be kept whilst listening and the details later written neatly into the official station log. A good idea, but I myself am far behind in re-writing my log. Thanks for the letter Dave.

S.w.l. 100 Certificate: As a few details were omitted from last month's notes, I will repeat all the information regarding this award. To qualify you must be resident in Victoria and produce evidence in the form of confirmations of having heard 100 Amateur Stations. The Certificate is free to W.I.A. members whilst a nominal fee of 2/6 is charged to non-members. Confirmations must have been made since 1/1/46. Your application must be accompanied by a list, in alphabetical order, of verifications submitted and the date of each verification. The verifications must be correctly addressed to you, i.e. they must be addressed to you by name, preferably both your christened and surname, or an official listener's station number. Such an indication as VK3-S.W.L. is not sufficient.

Dave Jenkin is still busy chasing coveys and in his spare time building his new rx. Len Poynter has another vehicle. Thinking of going mobile Len? Frank Nolan is understood to be still busy listening. (Boy! His mother cooks steak beautifully.) Yours truly had some bad luck recently when the fence, to which his antenna pole was attached, caught on fire. Yes, the fence was the one that started the fire. 14 Mc. across the roof. Seems to work better that way, too! A 2 el. rotary beam for 30 mc is almost ready and ready for erection.

David 3ZAT recently got a mention in one of our big city newspapers. Was that really a t.v. antenna on the little car, or a 2 mc beam, David, you optimist!

QUEENSLAND

In a letter from Taranga, Brisbane, Don Bryant says that he is busy building. He also hopes to have a BCMA and ARB rx soon. Let's know more about your activities Don. Another VK4 listener, Bruce Hughes, has written telling of his activities. He has an 838 rx which appears to be functioning quite well, considering the list of stations he has logged, including VQMR on 21 Mc. Congrats, if the great occasion has come around David.

SOUTH AUSTRALIA

The VK5 boys must like our sunny Melbourne weather. John Campbell, from that Division, was present at our last VK5 meeting. Mac Hilliard writes telling of the last VK5 meeting. Len 6C was present and gave an interesting talk on the reporting of Amateur signals. This resulted in Lea being bombarded with questions at the conclusion of his talk. Thanks for your efforts, Lea. Three new members were welcomed to the Group, namely Dennis Greig, John Hilditch and Don Colebatch. Warwick 6B8 will address the Group at its next meeting. (What subject? How to tune a rx?) I thought he'd forgotten that.—Ed

The VK5 Group meets on the third Monday of each month at Central Methodist Mission, Franklin Street, Adelaide, at 8 p.m. Roll up to these meetings you VK5 lads.

ESSEX

My correspondent from the land of mountains and apples still only gives his first name, which is Roger. Thanks for your letter. You're doing a good job keeping VK10 on the map. Roger has been hearing quite a bit of DX. Keep it up OB.

AMATEURS, ATTENTION!

Now to my current moon. 3300 Kc is the frequency on which slow wave transmissions are conducted by the W.I.A. V.D. On every Sunday evening from 8.30 p.m. to 9 p.m. E.A.S.T. So please give all those hearing the code a chance and keep this station clear of interference. You could listen yourself and brush up on the code. Thanking you all in anticipation.

So again for another month I must say thanks to all those who have written and hope to hear from you again. Cheers and good listening to you.

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BRIGHT STAR RADIO are pleased to announce an addition to their line of Crystals. We are now manufacturing—

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YL CORNER

BY PHYL MONCUR

"TV FEVER"

It's on again, that same old glow in their eyes, that same old not-with-you deeply engrossed look. The sort of look that makes you realise that you're not conversing, or rather, an eavesdropper or desirer. We saw it some thirty odd years ago when they first became interested in the new, but today it's something new. Television has come to us here in Australia and with it has opened up a wonderful new interest.

We called in on Snow 3CW. Business as usual? Good heavens no! It was the day the first test programmes were scheduled to be televised, and for the first time a call in on Snow, there was a steady stream of them all morning, all with the same enquiry—"Have you seen anything yet?" That same old glow; yes it was there in Snow's eyes.

Snow had had his TV set ready for months. He kept twitching to the various channels to illustrate effects of interference, etc. for our benefit. Snow had also been kept busy that morning making cups of tea and was washing up his limited supply of cups ready for the next surge of friendly enquirers when the screen went black. "What the heck now," he ejaculated and rushed to turn the switch, when in the dim light there appeared to be smoke rising from his precious TV set. There was a frantic turning off of switches and turning on of lights, only to find that the smoke was steam rising from his hands from the hot washing up water. Snow gulped and grinned that great big grin of his—"Fancy me falling for that one," he said.

Eventually I saw TV, the test pattern, a series of odd shapes and lines. So this was TV. I was definitely not impressed. However it was enough to ignite that glow in my OM's eyes and send him straight off to order a TV receiver.

Now, I had my own ideas about this TV business. I wasn't the slightest bit interested. I certainly wasn't going to waste time sitting down and looking at TV all day. I with it had to do, I just couldn't possibly spare the time. The day we waited for the receiver to come home was a day of barely suppressed excitement on the part of my old man, for me—I was beginning to feel just a little irritated with the whole thing. In the middle of our evening meal he decided to ring up his cobbler, Laurie SALV and invite him and his family over for the evening to see the TV. This it was just too much. All the shops were closed and here was I with not a thing in the house I could offer them for supper.

At five to seven there was an impatient "CQ?" sent on the front door bell and I barely had time to turn the handle on the door when it was flung open in my face and sent me sprawling across the hall floor. SALV had arrived and with a hurried—"Sorry Auntie Phyl, am I in time to see the test pattern come on?" he bounded up the passage to the shack. I lifted my head to see what had hit me when I was flattened once again—this time by his harmonic, who bounded up the passage after him. Before picking lifting my head again, I peeped warily out of one eye to see his XYL standing on the doorstep, gasping for breath and saying, "Oh this television isn't it terrible, we didn't have time to eat half our tea." This remark caused my blood to run cold. They'll be hungry, I thought, and I've got nothing to give them for supper.

We stood chatting in the hall for a few minutes then a call came from the shack. "Aren't you coming up to see the test pattern?" I should have said, "I suppose we'd better BY." A quarter past seven my irritability was getting to a high explosive state. This test pattern still had another three quarters of an hour to go before the programme would come on. Surely they weren't just going to sit there and look at the darn thing for the whole hour? But they were! There was only one thing for it. I went and got the bottle of sherry. We drank a toast to the TV. I failed to see any purpose in that but I needed the sherry. The effect of the sherry was wonderful, it wasn't long and Mary and I began to find even the test pattern amusing. Our OM didn't.

Eventually the programme came on. To my surprise it was very interesting. In fact it has been ever since. Mentally educational and travel films, it's just like having a newsworthy broadcast in the comfort of your own home, sitting in your favourite armchair beside your own covey. At the conclusion of the programme, Mary and I retired to the kitchen, we frantically

trying to think what I could run them up for supper. I settled for hot scones and when we returned to the shack armed with a plate of pretty doughy scones, we found the two OM's with our new commercial TV set in pieces all over the bench. Now that's what I call downright destructive, and just when I was beginning to take to the idea of this TV business.

Now I am finding myself hurrying up with the house work so that I can spare time to fit the TV in. Yes, I'm getting the TV fever and pretty fast, too. I even feel disappointed on the evenings when there is no TV programme scheduled. Of course it's a whole time occupation, it's rather difficult to do anything else and watch TV at the same time. The only thing that I've found that I can do while watching the TV is to shell the peas for tea. But then if you do this, it is advisable to buy only the best grade of peas, otherwise you are liable to dish up a gush or two with the evening meal. Of course there is a way over this too, just turn on the TV while the meal is in progress and nobody will notice the grub anyway.

Must put you wise to some of the terms you are going to hear in connection with TV. Crow is not the black bird that sits on top of the antenna, it's the screen where you see the pictures.

Eke is not the president of the United States, it's just another "toobee" (if you're American), "varive" (if you're English), and "bottle" (if you're dinkum Aussie). So that's how the sherry got into this story—Eek!

Well girls, there is at least some consolation in this new craze of the OM. Unlike the reward for patient suffering during the construction and testing (especially the testing) of a radio, rx or tx, which is nothing more than having to listen to that monotonous and incessant calling of "CQ, CQ," having survived the building and testing stages of the TV you will then have an unlimited source of entertainment that doesn't even smell like Amateur Radio.

TV fever is becoming epidemic, but don't be distressed, it's a rather pleasant ailment.

QRM a minute YLs and XYLs before you get back to your chores—this in your column, what about a contribution for it?

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FIFTY-SIX MECACYCLES AND ABOVE

NEW SOUTH WALES

It is interesting to note that the first three foxes getting in the surprise Scramble held on Sunday night, 26th Aug, were all calls of the full result of the contest being ZBZB 18 points, Z2AC 15, Z2AG 17, SHO 18, Z2CB 15, Z2ZN 14, Z2R 12, Z2Y 12, Z2V 12, Z2ANF 11, Z2CH 10, Z2E 9, ZHL 8, and Z2BH 7.

The Hidden Tx Hunt on 144 Mc. was well attended on the night of 8th Sept. when Horrie ZHL, and Charlie ZNP, selected a spot in the bush of the Castle Hill-Rogies Hill area and came on the air at 8 p.m. The cars set out from a point at Top Road and resulted in following Z2CA/Z2AA/Z2AF first to locate in 45 minutes, Z2WZ 50, Z2GF/Z2H-harmonized/navigator 70, Z2ANF/Z2R/Ken Z2AFH 91, Z2V 110, Z2CF/Z2BB 140 minutes. Although Bob Z2CA won the event, it was argued that "first in" should have been awarded to Z2G, as vintage Amaleus whose home and shack was right at the location. When Horrie ZHL arrived at the location just before 8 p.m., he and Chas ZNP were greeted by a chap armed with a shot gun and a fox making enquiries as to what was going on and when told not to worry that a radio experiment was being carried out by the V.H.F. Group of the W.A.A. and that no harm would come to his property, Z2G introduced himself, much to the amazement of Horrie and Charlie, as Z2WZ. Horrie gave him lots of credit for he did the job in 80 minutes single handed. Rageshaws and refreshments completed at about midnight and all cars then made for home after a very enjoyable evening.

The monthly general meeting of the V.H.F. Group was held on Friday, 11th Sept., and about 40 were in attendance. Visitors included Z2ON from Gosford, Z2AD from Tamworth, and Z2X from Wentworth Falls. Any business of the meeting was put aside to enable the Group to listen to a lecture from John Z2NF on "Noise Generator and their usefulness." John explained how easy it is to make and use one of these generators to enable converter and receiver noise to be reduced. John then gave a demonstration which was carried out by John for members who had brought along their converters for test, and as each member had his unit tested, the unit was then checked up on the noise converter, which ranged from 3.8 db. to 12.0 db. Besides expressing the Group's appreciation of the opportunity, visitors Z2AF and Z2V respectively to view some colour slides projected by ZHL and commented on by Z2NF, Phil Z2ER was thanked by John Z2NF for his useful notes and helpful lecture.

The "Blarck's Do" to be held during the 29th and 30th Sept. is likely to be attended by about 50 members of the Group who are looking forward to the event. From further North it has been learnt that Frank Z2PF is still as keen as ever and has improved his air and ground work and Muscle Z2AC is now running 50w to 6146. Frank Z2AD is working cross town with Frank. Reliable sources report that Z2AD, also of Tamworth will be on 2 mhz soon. It has come to our ears that Noel Z2PE and Steve Z2R have been looking at 80w v.h.f. after a number of years in the bush. The Z2GV has put up his 3 over 3 to 80 ft. and hopes to double that height soon. Geoff Z2VU has once again "found the band" and with the combination of Y2BL 822 mhz and putting out a good sig. Ken Z2NU has assembled material for a phased array and is also working reliable ironwork for his windmill tower—Z2FX.

VICTORIA

Nine cars and thirty enthusiasts competed in the last Fox Hunt, a wonderful turn up for it was a very cold night. But nobody seems to notice the temperature. It was a fine time to take a Fox Hunt and most competitors turn up at the final location gasping for breath and quite red in the face after the excitement of the chase. This Hunt traversed CLIFFS Hill, Studley Park, Hawthorn, Malvern and Burwood. At Studley Park, the fox ZLN found a gain of 30 ft. on the embankment of the river some 30 ft. above the roadway just after it crosses the outer circle bridge. Here from his lofty hide-out, he was able to watch the cars and the other while hound cars drove up and down. Roy Z2RY was the first to find him at this spot. Another good spot was at the rear of the house, within the Malvern Tower Hill. Here the fox hid himself amongst a lot of parked cars where he had a good view across the top of a main road and could pick out out bound cars as they passed by. The first

one to catch the fox here was Tom Z2OG, who made his catch on foot. The only hound who was going missing on the night was the police station was Noel Z2NS, who had Bill Z2QB assisting him as navigator.

All hounds were right on the fox's tail all evening and the fox was not seen until the winner was Tom Z2OG who made nine catches. This creates a record for a Fox Hunt. Second was Roy Z2RY and third was Noel Z2NS. Very excellent hunting on Noel's part as it was his first experience of a Fox Hunt. The final location was at the home of the contact station, Bob Z2L. Many thanks to Bob and Dorrie for inviting the Group to your home.

The lecturer at the last v.h.f. meeting was Alvin Elliott, Z2RE who gave a survey on 3 mhz DX conditions. It was an extremely interesting lecture and was the product of years of collecting information and studying conditions. Alvin discussed the various methods of DX propagation on the v.h.f. bands and then produced large weather maps for each of the nights when exceptional DX conditions prevailed on 3 mhz. He had also tabulated the radio sonde measurements of temperature and water vapour content for the same time and was able to illustrate many of the conditions that produced the DX workings of the time. It was very evident that Alan had put a lot of work into preparing his lecture, but his efforts were very much appreciated by the Group members, all voted it a very interesting and enjoyable lecture.

Jack Z2DO, Andy Z2DF and Ian Z2AP are experimenting with micro-wave "Fox" hunting starting at 1.315 Mc. and will perhaps later try up to 1.200 Mc. The tx they intend to use will be a 100 ohm on about 100 ft. of wire and a pair of xtal diodes on 1.315 Mc., straight into a resonant cavity with a probe in the cavity connected directly to a vertical ground plane with a corner reflector. Projector rx will use a similar local osc arrangement with a xtal diode mixer feeding into an LL on 144 Mc. They would be interested to hear from anyone who knows of any equipment that is suitable for use on this gear, particularly in regard to valves. They would also be interested to hear from anyone else who is working on these frequencies.

Interest in v.t.v. seems to be fast developing among the Amateur fraternity. Graham Z2RE is getting very satisfactory results from his home-brewed v.t.v. rx and reports that he has now got a picture. Associates in the Group are working on a v.t.v. rx. Several are known to be working on v.t.v. proving their equipment.

Max Z2AW with Roy Z2AE and John Z2AI report a successful recent Fox Hunt. They are running out tests on 144.31 Mc. Contact was made with Z2R and Z2LE in Melbourne. They were later heard by Z2R, of Albany, but no contact resulted as signals were too weak. A further attempt to contact will be made at a later date. Z2R and Z2PO have heard one another and it looks as though Albany will be able to become another established 144 Mc. path. Z2AM has contacted Z2ATN and Z2NN. Z2AM, who is located at Penzance, transmitting in the Melbourne direction each night at 2130 EST, for 10 minutes. His frequency is 144.03 Mc.

Remember the V.H.F. Group meets on the third Wednesday of each month at the W.R. rooms at 8 p.m. All are welcome. We were pleased to see a couple of new faces at the last v.h.f. meeting in Stan Euston and Roy Stone and Alan and Lou, passed through the last and A.O.C.P. course and both were successful in gaining their A.O.L.C.P. at the last exam and are now awaiting the allocation of their 2 calls. They are naturally very interested in v.h.f. gear and came along to the meeting to get some dope from the old hands—Floyd Moncur.

WESTERN AUSTRALIA

The August meeting of the W.A. V.H.F. Group was held at the QTH of G2AW. It was very good to see the very good attendance at these meetings is still maintained. After the business of the meeting was dispensed with, Dennis was the speaker of the evening, his subject being "Radio Astronomy," and from what we heard he showed that a lot of study has been put into the subject. "Mac" Dennis's column has passed his A.O.L.C.P. (congrats. "Mac"), so between them they hope to achieve something in Radio Astronomy. Dennis's column also passed his A.O.L.C.P. "nice work, John".

A Tx Hunt was held on Aug. 18, Frank Z2CC doing the hiding. Frank said that the result would be either nobody got in or everybody all arrive together. He was right as the latter was the case. The tx was hidden on the bank of the Swan River, right at the water level. The beam was barely two feet high, nice job,

Frank, Rob Z2BO was the first of the bunch to arrive.

Activity on the bands is still in the doldrums, weather being still very chilly at nights.

Sept. 1 saw another V.H.F. Group meeting under way, this time at D.C.A. Training School where members were shown how the young technicians-to-be were trained. We were very impressed with the grounding given in all aspects of radio, and the staff were very well away with a few ideas. Many thanks to D.C.A. officials for the facilities and time given to us. A very welcome visitor at the meeting was Merv Z2FO. We hope you have a happy stay in the West; maybe he will work you on 3 mhz comedy Merv.

Referring to GAW and Radio Astronomy at the Aug meeting, Dennis reported that "Mac" and he had some measure of success in getting signals back from the sun, and perhaps not discernable to the ear over rx noise, they showed up on an output meter; the frequency was 578 Mc., using a 3A74 r.f. stage into a tail-end Charlie modified "Mic" workmanship on the r.f. stage was very much admired, most comment I think was on the "Two Bob" Condenser tuning the quarter wave line. The antenna was a 13 ft. 6 in. parabola, also a master piece—Z2AV.

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grams. At the conclusion of the lecture another half hour passed while members fired him with questions which he seemed only too happy to answer. Hans JARH passed a vote of thanks to Alan for his interesting lecture and members applauded warmly to show their appreciation.

The President welcomed a visitor in the person of John ADG, ex-ADG, ex-ND, ex-EDD. Apparently John gets around a bit. Members were pleased to see him along at the meeting and to re-new acquaintance with him. Neil NAKK, who is a fairly new member, was the Institute, brought up an interesting point in regard to publicizing the W.I.A. and what he has to offer with the idea of attracting greater membership and also to give the new members some idea of the activities of the W.I.A. that they may participate in. An almost general discussion took place on this subject and some good points were brought forth. The following were welcomed as new members of the Institute—as full members, Messrs R. Baty, JAFB (ex-VRA and ex-JANB), R. Evington, ZCCA; A. Jones, JARU; G. Trill, JAIT, and as Associates Messrs L. McCusky, N. Harris, D. Ruby and W. Kent.

For the next general meeting to be held on 3rd October at the Radin School of the Royal Melbourne Technical College tentative arrangements have been made with Commandant R. B. terhin, R.A.N., to give an illustrated talk on the Navy's Program work.

Last event of "good cheer" is the Annual W.I.A. Dinner, which this year will be known as the Olympic Dinner, will be held on 18th Nov. at the Prince of Wales Hotel, St. Kilda. Tickets are expected to be approx. \$5.

The State Convention is scheduled to be held at Leongatha on the week-end 3rd and 4th Nov. Items to be included on the agenda paper should be forwarded to the Victorian Division office without delay. Those requiring accommodation should contact Ron Jardine, 327B, Blackmore Ave., Leongatha, as soon as possible. Arranging accommodation for a State Convention usually proves a very awkward job for the organizer as it is very difficult to estimate how many are likely to turn up to a convention and you would be assisting Ron greatly if you let him know as early as possible.

Keep in mind the Bi-Monthly All-Band Scramble, the first of which is on 22nd Sept. for Monday 1st Oct. between 2000 to 2200 hours E.A.S.T.

Donald Gibb, of Morgan St., Mount Morgan, Queensland, who is a member of the transport section of the Mt. Morgan mine, has written offering to show any VKJ chaps around the works should they be visiting that district at any time. Inspection times are approx. 4.30 a.m. and 1 p.m. Monday to Friday. Saturdays and Sundays are limited. He would like to have advance notice of approx. arrival time of any who would care to take up his offer.

Congratulations and best wishes are extended to two members of the Institute who have recently acquired for themselves a QSL certificate. Ron Fisher, 30M, was married on 8th Sept. and Bert Smith, 3AAP, on 15th Sept. Best of luck Ron and Bert.

VICTORIAN DIVISION ACTIVITIES

General Meeting First Wednesday in each month, held at the Radin School of the Royal Melbourne Technical College at 8 p.m.

For Hunt on 144 Mc: Second Wednesday in each month, commencing from the plantation College Crescent at the rear of the University at 8 p.m. Receiving gear for 144 Mc only is necessary. Bring your own super.

Bi-Monthly All-Band Scramble: Next round to be held on Monday, 1st October, between 2000 and 2200 hours E.A.S.T. An attractive certificate is awarded to the winner of each section.

V.H.F. Field Days are held during the summer months. Dates are advertised over 3WJ Sunday morning transmissions. Attractive certificates are also awarded to the winner of these events.

V.H.F. Meeting: Third Wednesday in each month at the W.I.A. rooms, 191 Queen St., Melbourne, at 8 p.m.

80 Metre Transmitter Bent is held approx. once a month, dates are advertised in the 3WJ Sunday transmissions. Attractive certificates are also awarded to the winner of these events.

Slow Morse Practice Transmissions: 8.30 till 9 p.m. each Sunday evening on 3550 Kc. and 145 Mc, at speeds of 5, 10 and 14 words per minute.

Book and Instrument Libraries are available to financial members and are open for use when the Administrative Secretary, Mr. May, is in attendance at the rooms on Tuesdays, Thursdays and Fridays between 10 and 4.30 p.m. Telephone number at the rooms is XY 1067. State Conventions at Leongatha, 3rd and 4th November.

HIGH FIDELITY FOR THE AMATEUR!

We all inherently have the capacity to enjoy music to some degree or another. It is therefore natural that the Amateur—a qualified technician in his own right—would apply his knowledge of Radio and Electronics to constructing his own High Fidelity Equipment for the home music installation when time permits. But even if his time is preciously applied in other directions he can still purchase ready-built equipment to provide for the family requirements in musical reproduction from gramophone records, tape recorders and wide-range tuners for enjoying the ultimate from the high class transmissions which are radiated from the modern broadcasting station.

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- ★ Goodmans Loudspeakers.
- ★ Barker "Duode" Loudspeakers.
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ice through to Gowler recently; Rex SKY, Ern BEN, Austin SWO and Bob SWI keep in touch also.

Paid a visit to Reg SQR recently and was met there by Douglas GBS, 2302, the conversation turned to stamps, QSL cards, methods of getting rare DX, etc., etc., and the purpose of my visit, v.h.f. information, was overlooked in the interest created by the alternate subjects. In fact there were so many DX C.C. Certificates cluttering up the floor that it was inappropriate to mention local ragchews on 2 m.

Frank SMZ is off to VK3, leaving here on 19th October, by car with 34 senior girls passing through the school. He is also in the States, staying at Victoria College Palace where he will be planned to meet any VK3 boys. He will be back at Ballarat on the 18th for the competitions and can be found at the South Street Hall. Look for the egg shell blonde, chaps, and don't let the Preston boys have it all their way.

NORTH WESTERN ZONE

The third annual general meeting of the Woollahra Club elected Bernie SQW as President, Ron SFY Secretary, and David SZDR Treasurer for the ensuing year. Congrats to all three, you have a good team at least keep those rhinoceroses! Planned to see the number of logs you people put up for R.D., very good idea. The club has a good team and family have been on the sick list, hope all will pass by the time you read this.

A little tired to see Bernie SQW may be living in the District soon, you will have to watch your humour "expression" when down here, or even take out a patent on it as Les SX did with his whistle.

My Port Lincoln spy reports Jack SVI is quite well, but finds pressure of work keeps him off the air. George SGJ is interestingly well, on v.h.f. soon. Pat SB has returned from hospital and we hope OK by now. Wall SDF still active on 40 mc Sunday mornings, he is making preparations for the 1953 new hi-fi modulator going, but 50 cycles will keep him quiet for a while yet.

SOUTH EASTERN ZONE

At "Gamblers'" meeting (before last) Claude SCH gave those present an interesting talk on the new power station equipment, and followed it up with a lecture on "Rock-Ed" and "Air-Ed" working, etc., at last meeting. Stewart SMS not heard yet, his re-build prevented his repeating last year's talk, but he begged us to let him also do the STW via SCH. Reg SKU founded the brass for 71 contacts so got into the swim. There is a new Z call at Penola, Bruce SMN I think the place to go. Dave, and we can make it, you never know your luck. Tom STW at present on leave in the Fair City, apparently resting his voice from R.D. work.

Bram SAB reported a hectic day on R.D. know why? He uses a first class DX set up with ve beams goodness knows how many wavelengths per leg. That gives about 8 degrees take-off. His first CQ KD brought back HPZFL and he could copy through the contest QRM. In spite of that disability he put up 392 contacts. Bram reckons to get tooled up for high angle radiation before next contest, in the meantime he is continuing to work SMS, CHS, VPS, etc.; half his luck.

WESTERN AUSTRALIA

The Divisional meeting for August was better attended than usual. Tom SMK gave a talk on the recent trip to G. Lang, the members have been asked to bring along any unusual or interesting gear, and some time was spent in examining the various items. The contest exhibition, GEC brought an oscillograph. SAW v.h.f. gear for one and two metres, GBS 4-500 Mc. gear, GZZ an a.s. grid dip meter, and GAG 1000 Mc. "oscilloscope" including an early 40w. 60 cycle alternator.

A vote of thanks was passed to GCU for the fine job he has done in the past. The members were required to put the case for an increase in power to 100w, maximum, so that Australia has the same power as the U.S.A., and hope he will be successful about it, although the members were with only three dissentients.

We are glad to welcome a new Associate member, Russel GEC from the U.S.A., and hope he will be a good time in VK3. As we have not had the final results of the R.D. Contest at the time of writing these notes I am not sure about it, although, according to congratulate the top scorers for an excellent performance, which appears to be a record for this Contest. Due to business QRM I have not been able to devote much time to Radio in the past month, hence these notes are somewhat short, but will try to do better next month.

TASMANIA

NORTH WESTERN ZONE

The annual general meeting of the North Western Zone was held at Ulverstone on 21st August, a good number being in attendance. I did count them at one stage, but they appeared to me to double towards the end of the evening, so no I'm not sure.

There was the usual rush of members to fill the various offices. Jim 770 was elected to the Presidential chair, being the only nomination for that position. Good Luck, Jim, for a successful year. The number below in asterisks were elected to the posts of Vice-Presidents, representing the Devonport and Burnie ends of our vast zone. They were the only nominees and were declared elected by our new President. Sid TSP was appointed Sec-Treas. Anyone owing S/- zone fees should hand them to Sid, he's been financing us for too long. In any case, the meeting instructed Sid to put a reminder on meeting notices. Dennis TDR is Asst. Sec. Yours truly, Len TLB, was elected as zone correspondent.

A lively interest was exhibited by the Associates throughout the evening. Keep it up, chaps. In fact by the evening, if I remember, everyone was lively. A warm welcome back to the fold to Niel TNS and Athol TLR. Let's see and hear more of you in the future. In the interest of the zone, Jim 770 and Dennis TDR, who opened their homes and gave of their supper and put up with our chatter at meetings during the year.

CORRESPONDENCE

The opinions expressed in these letters are the individual opinions of the writer, and do not necessarily coincide with those of the publishers.

WOOMERA AMATEUR RADIO CLUB

Editor "A.R." Dear Sir, I have read with interest the article in your September issue giving the history of the Woomera Amateur Radio Club, and I feel that it should add something to it in the interests of "credit where credit is due."

The problem of overcoming rules and regulations to that Amateurs could operate at Woomera was quite a difficult one and it was only the willing co-operation of all concerned that eventually allowed the club to be authorized and established. Chief among the club's supporters from the outset was Mr. W. A. Butler, the Chief Scientist of the Department of Supply. An Amateur of long standing himself, he had been active before the days of the first U.K. contacts with New Zealand in 1925, in which he played a leading part as G6TM—he was one of the originators of the idea of a hard radio club in Woomera.

It was always his wish to be present at the inaugural opening of the station, and he was able to spend an evening with the Club in its earliest days during which he established contact with several overseas Amateurs, demonstrating that he had not lost any of his old skill or enthusiasm. The Club has a great deal to thank him and his wife, Mrs. M. Butler, who has been a great help in the club, for his place on record in your journal.

—A. G. FITHER.

[We thank Group Captain A. G. Fither for this additional note, which, along with Mr. Butler's call sign is now VK3AD.—Ed.]

NATIONAL FIELD DAY CONTEST

Editor "A.R." Dear Sir, I would like to take advantage of the invitation to offer suggestions to readers of "Amateur Radio" to improve and to further interest in the National Field Day Contest. I have myself taken part several times in the National Radio Society of Great Britain N.F.D. Contests, and I am sure that perusal of the copy of these latter rules, which are available to all members of the Contest Committee, will be of considerable help to them in their efforts to increase interest in the next Australian Contest.

May I make a few suggestions, and give a few hints, which, along with the 1953 N.F.D. results, to illustrate the interest shown in Great Britain in connection with their Contest, and the results which have been obtained. The contest is run on a 24 hour basis, and with the maximum permitted input power of 3 watts (c.w. only).

Entries must be from properly constituted town or area groups within the British Isles, whereas in Australia, entries would obviously have to be individual efforts, and the Contest Rules framed accordingly. In the British Isles a group is permitted to place two stations in operation, awards being made for the highest combined score, to best score on the band, etc. Stations operate on the 1.5, 3.5, 7 and 14 Mc.

bands scoring 1 point for fixed stations in the British Isles, 2 for Europe, 3 outside Europe, and 6 points for fixed stations in the British Empire. 3, 4, 6 and 15 points respectively are awarded if the contact is with a portable station. By arrangement, the Radio Society of Switzerland hold their Contest on the same day, which fact helps enormously to stimulate interest, and provides additional portable contacts for contestants. The Contest period of 24 hours is satisfactory for group contestants, but too long for those who desire an immediate result. The Contest is held in June, giving long hours of daylight, and good prospects of fair weather and fair communication conditions.

There were 125 entries in the 1953 Contest, and sixty of these operated on the four bands available and the majority of them operated two stations, so that there were in all nearly 200 portable stations on the air. Equipment used was various, one station compiling a respectable score with the aid of dry batteries only, and 8-v-1. The most successful contestant was the Gravesend Group with a total score of 1188 points. They scored 309 points on 7 Mc. and 807 points on 14 Mc. The top score on 14 Mc. was 243 points, 7 Mc. and 14 Mc. producing DX contacts with stations in EL, LU, VE, VO, Ws and KP4, all on 3 watt!

Empire portable contacts providing 15 points to the lucky ones, were with ZR1, ZC4, TP4 and VSIGL. What a wonderful performance!

In view of the difficulties in securing suitable equipment, and the fact that it is necessary to introduce a series of articles on the construction of suitable simple portable gear for N.F.D. use. Home-built and/or converted disposable gear, or available, or commercial units. The simpler the better! I am sure that if "A.R." shows interest in this regional interest, the members themselves will ultimately follow.

—Frank E. Atkins, VK3AFE.

[The Technical Editor would be pleased to receive articles dealing with the construction of any equipment of this type.—Ed.]

STOP PRESS

MISSING DIVISIONAL NOTES

Publication date was put back this month owing to the postal delay, but unfortunately the Divisional Notes had not arrived prior to going to press.

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- Secondary impedance range—200 ohms to 21,000 ohms.
- Highest efficiency—lowest weight per watt.
- Easy to solder heavily silver plated tags.
- Above or below chassis wiring.
- Capacity—30 to 250 watts as under:

Tag No.	Audio WPM	Power (Watts)	Max. Sec. Ohms	Primary Imp. Ohms	Dimensions (inches)	Weight (lb. oz.)	Price (incl. Sales Tax)
UM1	30	60	120 Ma.	3½" x 3½" x 3½"	5 8		£6/13/0
UM2	60	120	200 Ma.	5½" x 4½" x 5½"	11 8		£9/9/6
UM3	120	240	250 Ma.	5½" x 5½" x 5½"	14 8		£10/15/6
UM4	250	500	400 Ma.	10½" x 6½" x 8½"	41 0		£28/18/0

For Minimum Hum—Maximum Efficiency

WODEN MICROPHONE TRANSFORMERS

Enclosed in a drawn heat-treated case of heavy gauge mu-metal, this type MT Microphone Transformer is suitable for use where MINIMUM HUM pick-up and MAXIMUM EFFICIENCY is required. It is designed for use with a moving coil microphone from 15-30 ohms impedance and on type MT101 the centre tap of the primary is connected to one side of the secondary and earth. One hole fixing allows rotation for minimum hum pick-up. Dimensions: 1" dia. x 1½" long. One hole fixing: 7/16" dia. hole. Type MT101 Ratio 50 : 1 overall. Price £3/14/6 includ. Sales Tax.

Available from selected wholesale houses in all States !

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